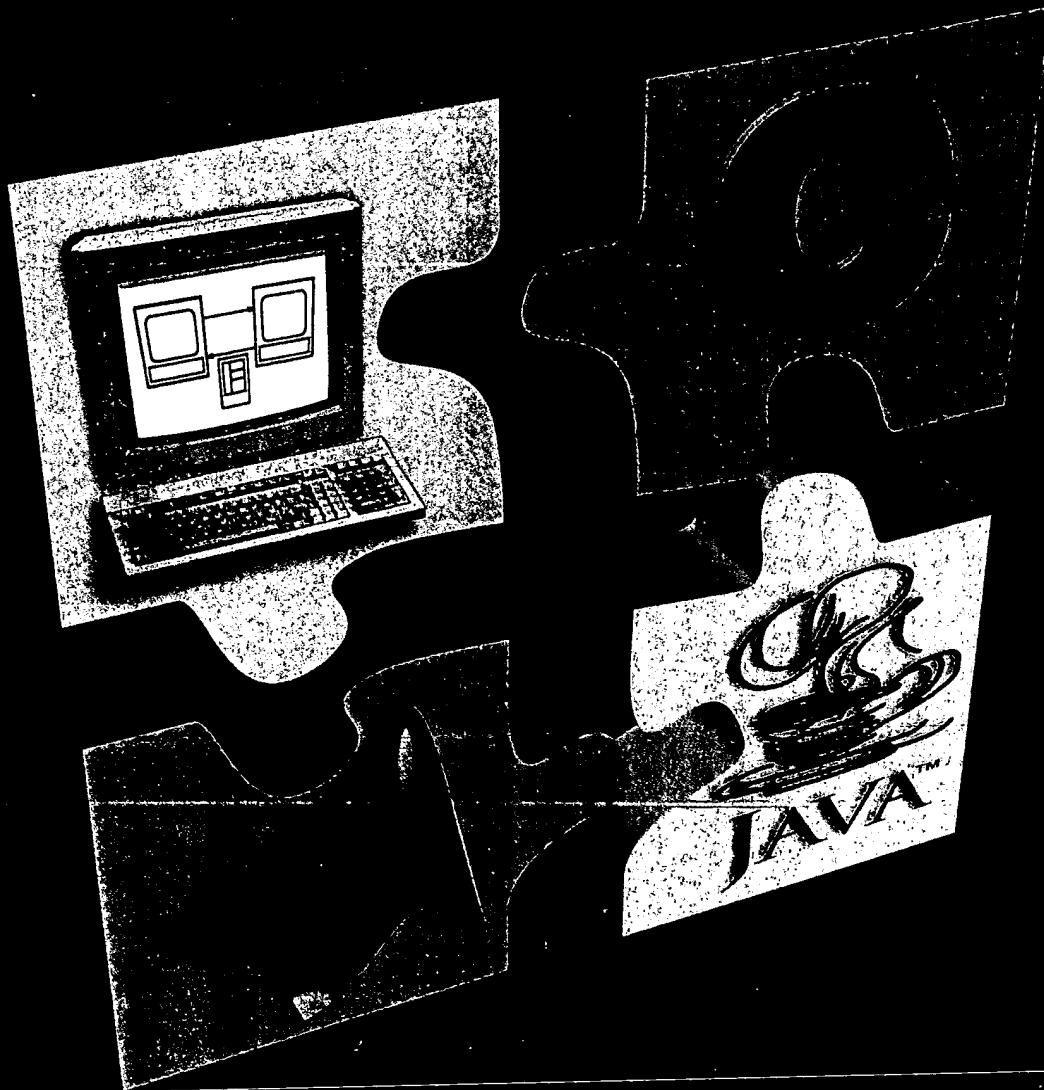




ENGINEERING PROGRAMMING C, MATLAB, JAVA™



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PART 4

JAVA PROGRAMMING TUTORIAL

This Java tutorial is for engineers who are familiar with C and who want to learn how to program stand-alone Java applications and Java applet programs that can be displayed by a web browser. There are two reasons we are requiring a knowledge of C as a prerequisite. First, many syntactic details of Java, such as the syntax for arithmetic expressions, and looping and branching constructs, have been borrowed from C. We refer readers to the C tutorial for detailed coverage of topics that are common to both languages. The second reason for the prerequisite is that Java is often described in terms of features it does not support. For example, many of the language constructs C programmers have difficulty with, such as pointers and pointer arithmetic, dynamic allocation and reallocation of memory, have either been removed from Java or are automatically handled by it.

We see that although Java was originally designed for applications programming in the consumer electronics industry, the language has most recently captured the attention of the software community because its features enable the development of applications that can run anywhere on the Internet and the World Wide Web. Java is an architecture-neutral object-oriented language that can process multiple tasks simultaneously. Each of these terms will be fully explained in this tutorial. From a user's point of view, whether the software is object-oriented or not does not change anything. You run a program and you do not care if it has been written with an object-oriented language. But if you are accustomed to programming in conventional languages such as C and MATLAB, "object-oriented" means major adjustments to the way applications are planned and implemented. This adjustment is probably the hardest part in learning Java.

In this tutorial, we illustrate the process of designing and implementing object-oriented programs in Java for temperature conversion, computing the roots to a quadratic equation, and computing and plotting the time-history response of a single degree of freedom oscillator. Further engineering applications are found in the exercises section of Chapter 19.